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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,626	01/30/2002	Jianjun Yang	10004000-1	2473

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AGILENT TECHNOLOGIES, INC.
INTELLECTUAL PROPERTY ADMINISTRATION, LEGAL DEPT.
P.O. BOX 7599
M/S DL429
LOVELAND, CO 80537-0599

EXAMINER

PROCTOR, JASON SCOTT

ART UNIT PAPER NUMBER

2123

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/062,626

Applicant(s)

YANG, JIANJUN

Examiner

Jason Proctor

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: See Continuation Sheet.

Continuation of Attachment(s) 6). Other: Requirement for Information 37 CFR 1.105.

DETAILED ACTION

Claims 1-3 have been submitted for examination. Claims 1-3 have been rejected.

Specification

1. The disclosure is objected to because of the following informalities: Numerous punctuation errors have been found by the Examiner, such as superfluous periods (page 3, line 12; page 4, line 3) and omitted periods (page 5, line 7). Applicants' assistance is respectfully requested in identifying and correcting these as well as any additional punctuation or grammatical errors that may be found in the specification, especially in light of the numerous mathematical equations contained therein.

Appropriate correction is required.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the method of claims 1-3 and the data processing system of claims 1-3 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing

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should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-3 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 generically recites that coefficients C_{ij} are “constants that depend on said mixer design”. The disclosure teaches a method to determine the model coefficients C_{ij} on page 4, lines 13-24, by making reference to the matrix $[T]_{M \times M}$ shown in Fig. 2. The matrix shown in Fig.

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2 is not 15 x 15 but rather 12 x 16. The disclosure teaches that “for most practical mixer applications, $M=15$ is sufficient” (page 4, lines 23-24). The disclosure does not describe what mixer applications require a 12 x 16 matrix.

The disclosure teaches a method of deriving the coefficients C_{ij} where Eqs. (1) and (3) are compared with the substitution shown in Eq. (2). However, the exemplary substitution shown in the specification (page 3, lines 14-25) fails to make certain assumptions clear. For example, A and B (which, although undefined anywhere, are apparently constants) are implicitly defined as equal to 1, else Eq. (3) is in error. (The symbols w_1 , w_2 , and t are also undefined anywhere, although their meaning may be tentatively presumed from the context of Eq. (2).) The Examiner respectfully suggests that additional disclosure of the algebraic steps that produce Eq. (3) would be helpful in describing Applicants' invention. No new matter may be added, but equivalent algebraic steps may be shown.

4. Claims 1-3 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The method taught by the disclosure is directed toward finding coefficients that define a mathematical equation that models the performance of a mixer. In contrast, claims 1-3 are directed toward “a method for operating a data processing system to simulate a mixer”. While the disclosure suggests an intended use for the mathematical model (page 5, lines 9-20), a

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suggested intended use is insufficient to enable the invention. The technological art of circuit simulation is complex and diverse; merely suggesting that these equations could be put to use in that field does not permit a skilled artisan to make and use the claimed invention.

The disclosure requires several steps of experimentation to achieve results [*"These coefficients can be determined by measuring the b_2 when a_1 and a_3 are single tone signals."* (page 2, lines 14-15); *"Here, S_{11} , S_{22} , and S_{33} are constants determined by a vector network analyzer measurement or by an S-parameter simulator."* (page 3, lines 11-12)]. The field of circuit simulation is notoriously complex and requires extensive experimentation to properly implement. The disclosure alleges that an intended use for the invention exists but provides no working examples or exemplary embodiment. A person of ordinary skill in the art would be unable to make and use the claimed invention without undue experimentation in light of at least the complexity of the art, the quantity of experimentation required by the disclosure, and the amount of direction provided by the inventor.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-3 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "a method for operating a data processing system to simulate a mixer" comprising the steps of "defining an input signal", "defining an input signal", and "representing the signal". The recited steps amount to a mathematical algorithm that does not fulfill the stated

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function of the preamble. The bounds of the claimed method are therefore indefinite. It is unclear how to apply patentable weight to the stated function of the preamble where the recited limitations do not fulfill that function.

Claim 1 recites "a method for operating a data processing system to simulate a mixer" comprising two steps of "defining" and a step of "representing". The step of "representing" appears to be a mathematical definition. It is unclear what is actually performed by the method. It is unclear what the result or output of the method would be. The specification fails to provide an adequate description of the claimed method such that a reasonable interpretation can be made.

The method of claims 2 and 3 is ambiguously defined. While claim 1 is directed to the operations of a data processing system, both claims 2 and 3 recite limitations related to the methods by which data values are derived. Presumably, the results from the "measuring" and "simulating" of claims 2 and 3 is input for the method of claim 1, however claim 1 has no step of "receiving input" or an equivalent. Claims 2 and 3 appear to recite product-by-process claims in that they recite a process that creates the simulated mixer of claim 1. In the event that this interpretation accurately reflects the patent protection sought, very little if any patentable weight can be granted to claims drafted in this format. Please see MPEP 2183 regarding the requirements to show equivalence in a product-by-process claim.

Claims rejected but not specifically mentioned stand rejected by virtue of their dependence.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-3 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. MPEP 2106 (IV)(B)(2)(b) states:

A claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under 35 U.S.C. 101. *Schrader*, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan (discussed in i) below, or (B) be limited to a practical application within the technological arts (discussed in ii) below).

The form of claims 1-3 does not invoke a physical transformation outside the computer, thus the statutory nature of these claims depends on the practical application within the technological arts for the method. MPEP (IV)(B)(2)(b)(ii) states:

A process that merely manipulates an abstract idea or performs a purely mathematical algorithm is nonstatutory despite the fact that it might inherently have some usefulness.

And further:

For example, a computer process that simply calculates a mathematical algorithm that models noise is nonstatutory. However, a claimed process for digitally filtering noise employing the mathematical algorithm is statutory.

Claim 1 recites a purely mathematical algorithm wherein the only functional step is computation of the value *b2*, defined as a summation operation. The preamble suggests that the method will “simulate a mixer,” however the method produces a numerical result. Claim 1 recites a computer process that simply calculates a mathematical algorithm that models a circuit and is therefore nonstatutory.

It is impossible to determine whether claims 2 and 3 are statutory in light of the rejections under 35 U.S.C. § 112, first paragraph, set forth above. Specifically, when an independent claim

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recites a mathematical algorithm performed by a computer, it is impossible to determine whether steps of measuring or simulating to determine constants for that algorithm properly constitute pre-computation or post-solution activity. However, if Applicants choose to amend the claim language in order to obviate these rejections, the Examiner respectfully suggests consideration of *In re Sarkar*, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) as it pertains to safe harbors and steps of determining values to be substituted into mathematical equations.

MPEP 2106(II) reads as follows:

It is essential that patent applicants obtain a prompt yet complete examination of their applications. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement for patentability in the initial review of the application, even if one or more claims are found to be deficient with respect to some statutory requirement. Thus, Office personnel should state all reasons and bases for rejecting claims in the first Office action. Deficiencies should be explained clearly, particularly when they serve as a basis for a rejection. **Whenever practicable, Office personnel should indicate how rejections may be overcome and how problems may be resolved.** A failure to follow this approach can lead to unnecessary delays in the prosecution of the application. (emphasis added)

In the instant application, the Examiner is unable to indicate how to overcome the rejections under 35 U.S.C. § 101 rejections for primarily two reasons. The first is that the disclosure teaches a mathematical algorithm, a type of invention that is notoriously difficult to claim in compliance with 35 U.S.C. § 101. The second is that the disclosure does not provide adequate subject matter to support claiming the mathematical algorithm as incorporated in an otherwise statutory invention. For example, suggesting that the method could be claimed as part of a circuit simulator including sufficient statutory safe harbors (specification, page 5, lines 4-20; safe harbors are described in MPEP 2106 (IV)(B)(2)(b)(i)) would expose the claimed invention to serious deficiencies under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description and enablement requirements. Therefore the Examiner is unable to instruct Applicants how the rejections may be overcome.

Claim Interpretation

In summary, claims 1-3 are so indefinite and replete with errors that no prior art examination is feasible. Specifically, the Examiner should not rely “on what at best are speculative assumptions as to the meaning of the claims”, and should not base “a rejection under 35 U.S.C. 103 thereon...[when] the claims do not particularly point out and distinctly claim the invention as required by 35 U.S.C. 112.” *In re Steele*, 305 F.2d 859, 134 USPQ 292, 295 (CCPA 1962). Also see *In re Citron*, 45 CCPA 773, 251 F.2d 619, 116 USPQ 409.

Note that claims 1-25 have been rejected under 35 USC § 101 as being drawn to non-statutory subject matter, and further rejected under 35 USC § 112, second paragraph, for indefinite claims. The Examiner believes that it would be counter-productive to make speculative assumptions for the purpose of examination against prior art. These claims will be examined against prior art only after such an examination becomes feasible. In the interest of compact prosecution the examiner has cited any relevant prior art that was uncovered during prior art search on the attached PTO 892 form.

Conclusion

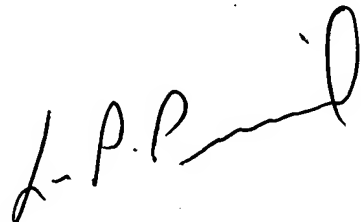
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Art considered pertinent by the examiner but not applied has been cited on form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Proctor whose telephone number is (571) 272-3713. The examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached at (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jason Proctor
Examiner
Art Unit 2123

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LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Requirement for Information – 37 CFR 1.105

Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the Examiner has determined is reasonably necessary to the examination of this application:

1. The citation for and copies of any journal articles describing any goods or services the claimed subject matter has been embodied in. In particular, references that will help explain the state of the art to which Applicants' invention most closely pertains.
2. The trade name of any goods or services the claimed subject matter is embodied in. Applicants' disclosure states that the invention may be implemented as part of a circuit simulator. If a circuit simulator is commercially available which implements Applicants' invention, citation of the product is required.

The fee and certification requirements of 37 CFR 1.97 are waived for those documents submitted in reply to this requirement. This waiver extends only to those documents within the scope of this requirement under 37 CFR 1.105 that are included in the applicant's first complete communication responding to this requirement. Any supplemental replies subsequent to the first communication responding to this requirement and any information disclosures beyond the scope of this requirement under 37 CFR 1.105 are subject to the fee and certification requirements of 37 CFR 1.97.

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The applicant is reminded that the reply to this requirement must be made with candor and good faith under 37 CFR 1.56. Where the applicant does not have or cannot readily obtain an item of required information, a statement that the item is unknown or cannot be readily obtained will be accepted as a complete reply to the requirement for that item.

This requirement is an attachment of the enclosed Office action. A complete reply to the enclosed Office action must include a complete reply to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Proctor whose telephone number is (571) 272-3713. The examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached at (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3713.

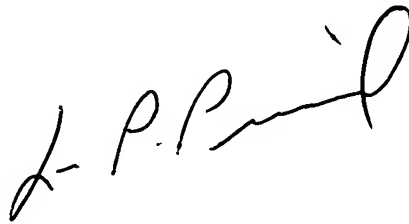
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason Proctor
Examiner
Art Unit 2123

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A handwritten signature in black ink, appearing to read "L. P. Picard", written in a cursive style.

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100